PART NO. EM10S-EN1-1

# Operator's Manual

# EX60-3

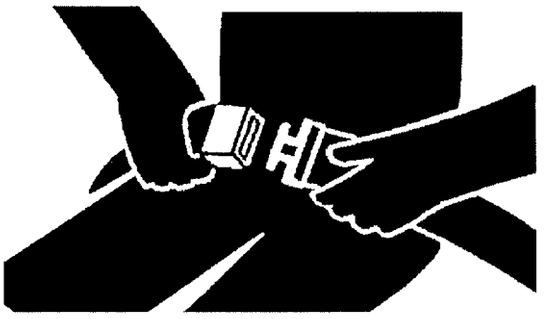
# Excavator

Serial No. 40001 and up

HITACHI

## FASTEN YOUR SEAT BELT

Always check the condition of the seat belt, and mounting hardware before starting the machine.
A weak or damaged seat belt and mounting hardware can result in serious injury if it fails in the event of an accident.
Be sure to use the seat belt when operating the machine.



SA-237

## OPERATE ONLY FROM OPERATOR'S SEAT

Avoid possible injury or machine damage. Do not start the engine by shorting across starter terminals.

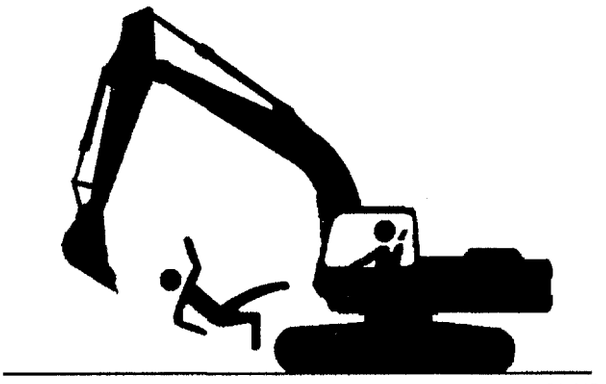
NEVER start the engine while standing on ground. Start the engine only from operator's seat.

SA-008

## KEEP RIDERS OFF MACHINE

Only allow the operator on the machine. Keep riders off.

Riders on machine are vulnerable to injury such as being struck by foreign objects or being thrown off the machine.
Riders also obstruct the operator's view, resulting in unsafe operation.

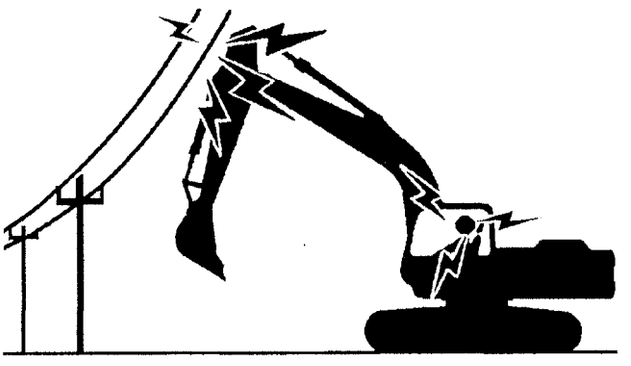


SA-017

## AVOID POWER LINES

Serious injury or death can result from contact with electric lines.

Never move any part of the machine or load closer to any electric line than 3 m (10 ft) plus twice the line insulator length.



SA-013

## PREVENT PARTS FROM FLYING

Grease in track adjuster is under high pressure.
DO NOT REMOVE GREASE FITTING OR VALVE ASSEMBLY.

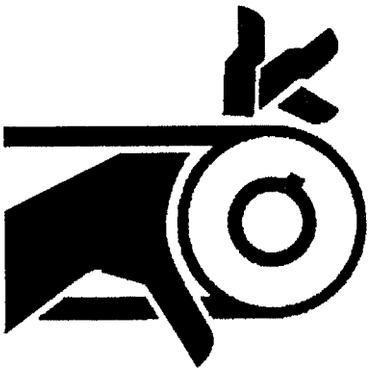
As pieces may fly off, be sure to keep body and face away from valve.

Travel reduction gears are under pressure.
AS PIECES MAY FLY OFF, BE SURE TO KEEP BODY AND FACE AWAY FROM AIR RELEASE PLUG TO AVOID INJURY. GEAR OIL IS HOT. WAIT FOR GEAR OIL TO COOL, THEN GRADUALLY LOOSEN AIR RELEASE PLUG TO RELEASE PRESSURE.

## STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

To prevent accidents, care should be taken to ensure that hands, feet, clothing, jewelry and hair do not become entangled when working around rotating parts.

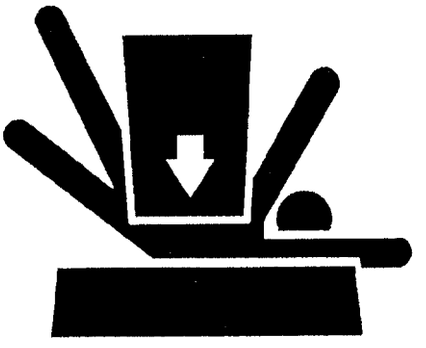


SA-026

## SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

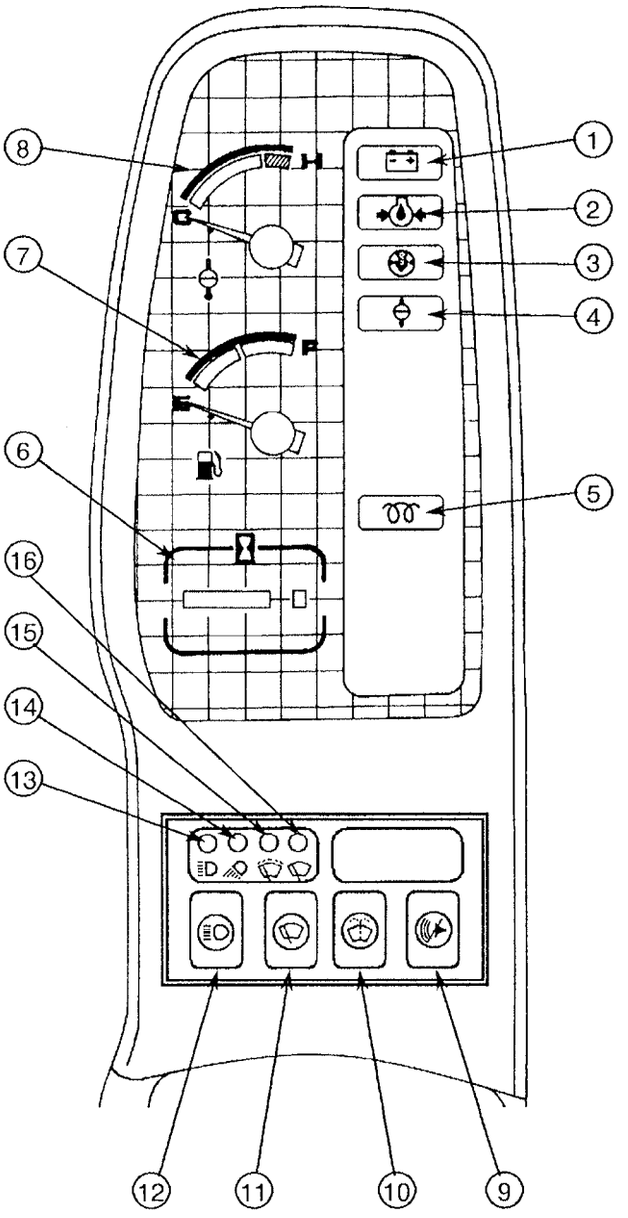
Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow the procedures in this manual.



SA-027

## MONITOR PANEL AND SWITCH PANEL 1

1 — Alternator Indicator
2 — Engine Oil Pressure Indicator
3 — Air Filter Restriction Indicator
4 — Overheat Indicator
5 — Preheat Indicator
6 — Hour Meter
7 — Fuel Gauge
8 — Coolant Temperature Gauge
9 — Buzzer Stop Switch
10 — Washer Switch
11 — Wiper Switch
12 — Light Switch
13 — Head Light Indicator
14 — Work Light Indicator
15 — Intermittent Wiper Indicator
16 — Wiper Indicator

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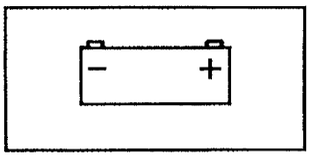
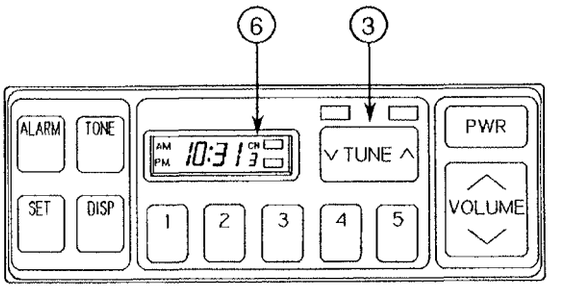
## ALTERNATOR INDICATOR

Red indicator will light with low alternator output.
Check electrical system.




M104-01-004

b. The automatic search function is activated by depressing and holding tuning control switch ③ for more than one half second. Automatic search changes from one frequency to the next strongest frequency.
In both cases, the frequency automatically appears on digital display ⑥; five seconds after switch is no longer depressed frequency display is replaced by the digital clock display.




M104-01-025

3. Setting tuning buttons

**IMPORTANT: Tuning buttons and clock will need to be reset any time the machine batteries are disconnected.**

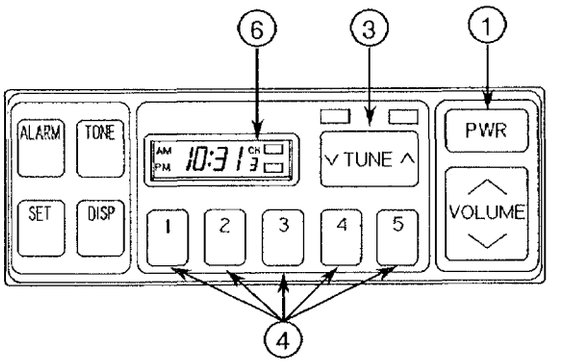
*NOTE: Setting tuning buttons allows the operator to quickly select desired frequency.*

a. Turn radio power switch ① ON.

b. Use tuning control switch ③ to set radio to desired frequency.

c. Depress and hold one of preset tuning buttons ④ for more than two seconds to set desired frequency. After the desired frequency has been set display ⑥ will show correct radio frequency. Release button.

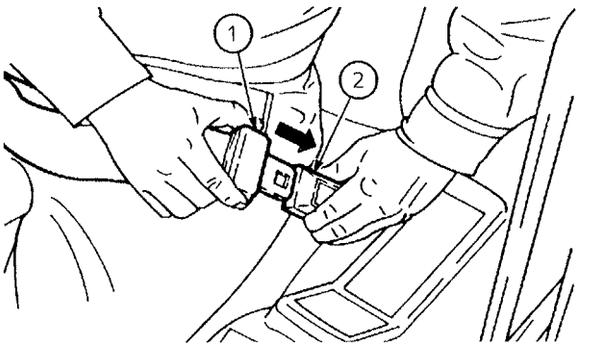
d. Repeat procedure to set remaining buttons or to reset a button to a different frequency.




M104-01-025

## SEAT BELT

**CAUTION: Be sure to use the seat belt when operating the machine.**
**Before operating the machine, be sure to examine seat belt ①, buckle ②, or attaching hardware. Replace seat belt ①, buckle ②, or attaching hardware if they are damaged, or worn.**
**Replace seat belt ① every three years, regardless of appearance.**



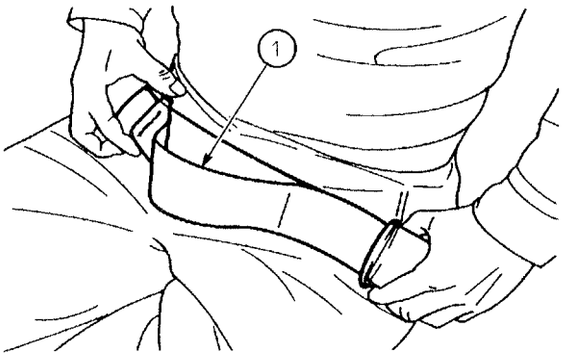

M107-01-044

### Seat Belt

1. Confirm that seat belt ① is not twisted securely insert the end of seat belt ① into buckle ②.
   Lightly pull on the belt to confirm that the buckle latches securely.

2. Adjust seat belt ① so that the belt is snug but comfortable.

3. Push button ③ on buckle ② to unfasten seat belt ①.

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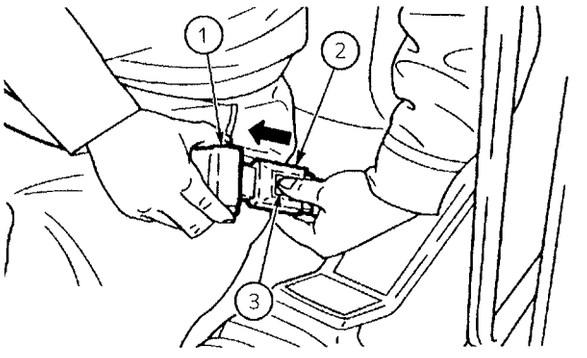


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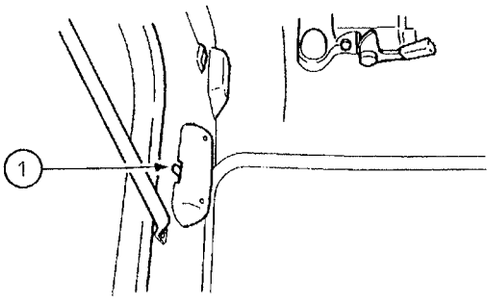
## DOME LIGHT

Move the switch ① to turn the inside cab light on or off.

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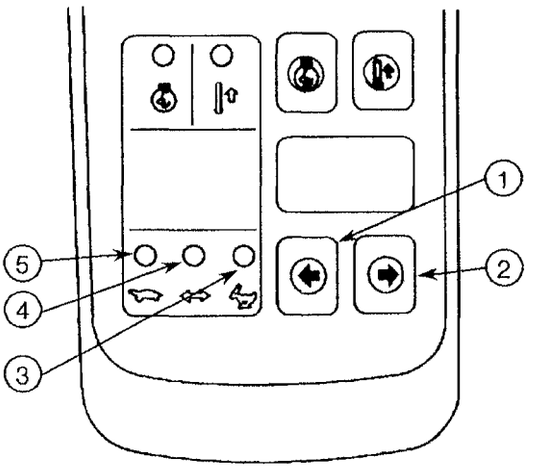
## TRAVEL MODE SWITCHES

**CAUTION: Tipping accidents can cause serious personal injury. Do not change travel mode while traveling; especially, changing speed to the fast mode when descending slopes will create a very dangerous situation. Always stop the machine before changing the travel mode speed. Confirm the travel mode indicators after changing.**

Fast speed (rabbit), medium speed, or slow speed (turtle) can be selected by pushing switches ①, ② in each power mode (PELI).
Indicator lights ③, ④, ⑤ show mode selection.

To decrease travel speed, for traveling on a slope or in a tight space, press switch to turtle position.

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1 – Travel Speed Decrease Switch
2 – Travel Speed Increase Switch
3 – Travel Mode Indicator (Fast Speed)
4 – Travel Mode Indicator (Medium Speed)
5 – Travel Mode Indicator (Slow Speed)

## PARKING THE MACHINE

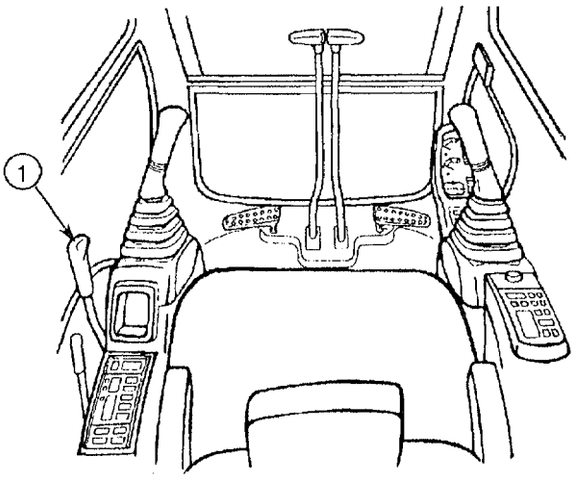
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: Turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine in slow idle "I" mode without load for 3 minutes.
5. Turn the key switch to OFF. Remove the key from the key switch.
6. Pull the pilot shut-off lever ① to the LOCK position.

**IMPORTANT: Protect cab electrical components from bad weather. Always close windows, roof vent and cab door when parking the machine.**

7. Close windows, roof vent, and cab door.
8. Lock all access doors and compartments.

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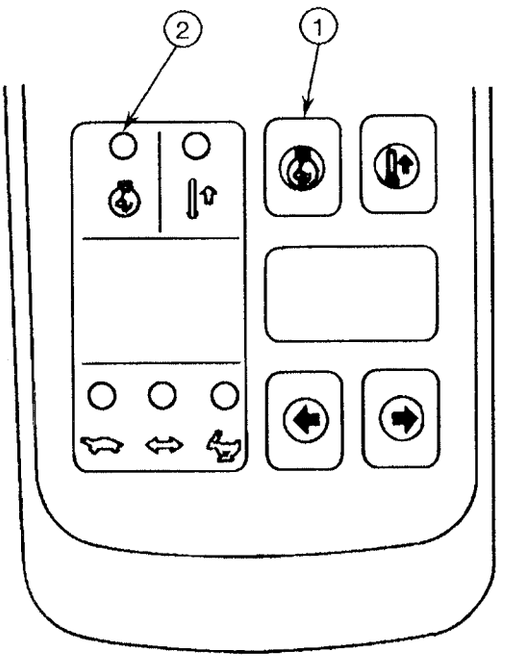
## AUTO-IDLE SWITCH

The auto-idle device automatically reduces engine speed after a few seconds when all control levers are placed in neutral, in order to save fuel.

**CAUTION: Unexpected machine movement can cause serious personal injury. Turn auto-idle switch off when automatic acceleration/deceleration of engine speed is not desired and when stopping engine.**

**Always check the auto-idle switch before operating any control levers. When ON and with the power selector switch in P, E, or L mode, the engine speed lowers to auto-idle speed approximately 4-6 seconds after the control levers are returned to neutral.**

**Always make sure the auto-idle switch is OFF when loading or unloading the machine, as the engine speed will increase to power selector switch setting (PEL) if any control lever is accidentally operated while the auto-idle switch is ON.**

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Push auto-idle switch ① to turn circuit on. Auto-idle indicator ② will light.

If the engine is started with auto-idle switch ① on and the power selector switch in P, E, or L mode, the engine will run at auto-idle setting after approximately 4-6 seconds.

Engine speed will change to power selector setting if any control lever is operated.

If the engine is started with the auto-idle switch off, the engine will run at the power selector setting.

Auto-idle function is backed up by batteries. If the engine is stopped by turning off the key switch while auto-idle function is in operation, the function will re-engage when the engine is started again.

Push the auto-idle switch off to improve machine control in difficult work areas, and while loading unloading.

## Long Arm Operation---If Equipped

1. The optional 2.81m (9 ft 3 in) long arm is only for light works such as loam loading, sludge handling,etc..Do not use it for heavy works such as digging gravel. When the arm is used for digging, apply shallow cut to the ground to avoid tough digging, or from or arm damage may result.

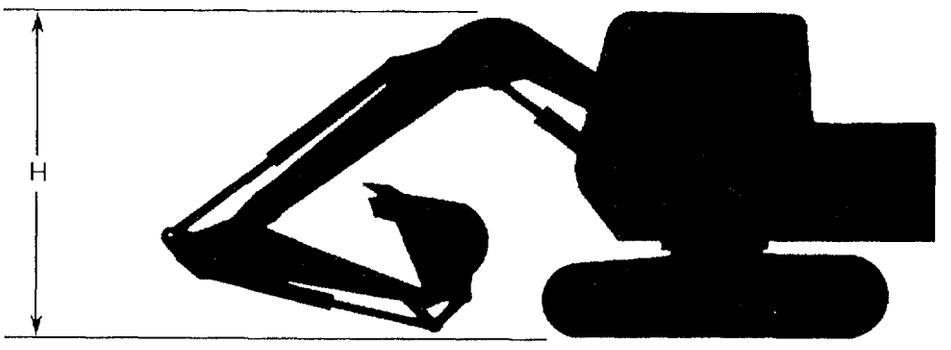
2. When the machine is equipped with the 2.12m (6 ft 11 in) long arm,the hoe-bucket size must be limited to the followings due to stability and strength of the machine;
   PCSA 0.24 $m^3$ (0.31 $yd^3$)

When transporting the machine,follow the procedure shown below to convert it into the transporting posture.

(a) Position the bucket cylinder with rod retracted a little from the fully extended position.
(b) Position the arm cylinder with rod retracted a little from the fully extended position.
(c) Lower the boom until the arm top comes into contact with the ground.

| Height of Front Attachment (H) | |
|---|---|
| Without Bucket | With Bucket |
| 2690 mm (8'10") | 2850 mm (9'4") |

Dimensions include shoe-lug height.

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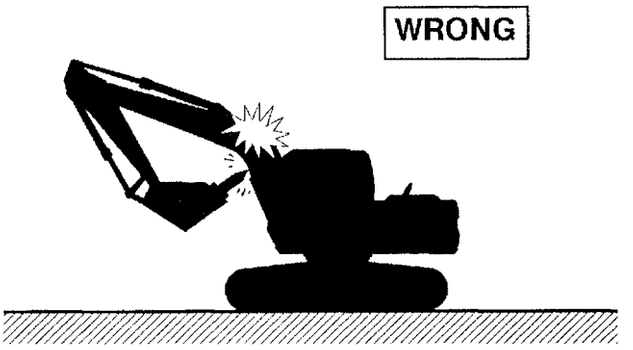
7. Operate the hydraulic excavator carefully to avoid hitting the boom.

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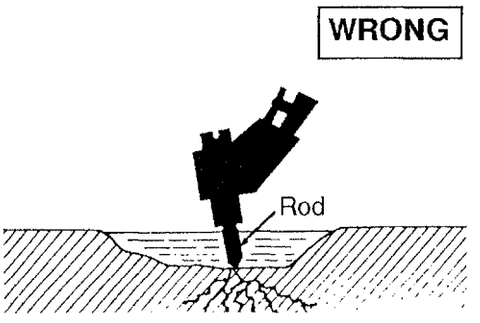
8. Do not operate the breaker in water. Doing so will cause rust and seal damage, resulting in damage to the hydraulic system components.

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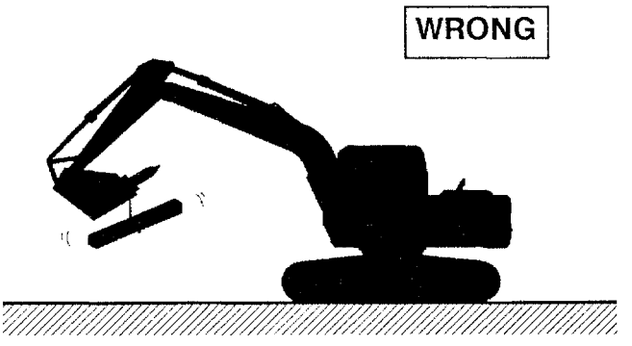
9. Do not use breaker for lifting operation. The machine tipping over and /or breaker damage may result.

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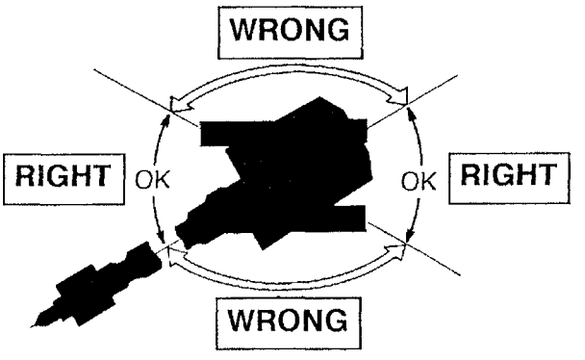
10. Do not operate the breaker to the side of the machine. The machine may become unstable and shortened undercarriage component life may result from operating the breaker to the side of the machine.

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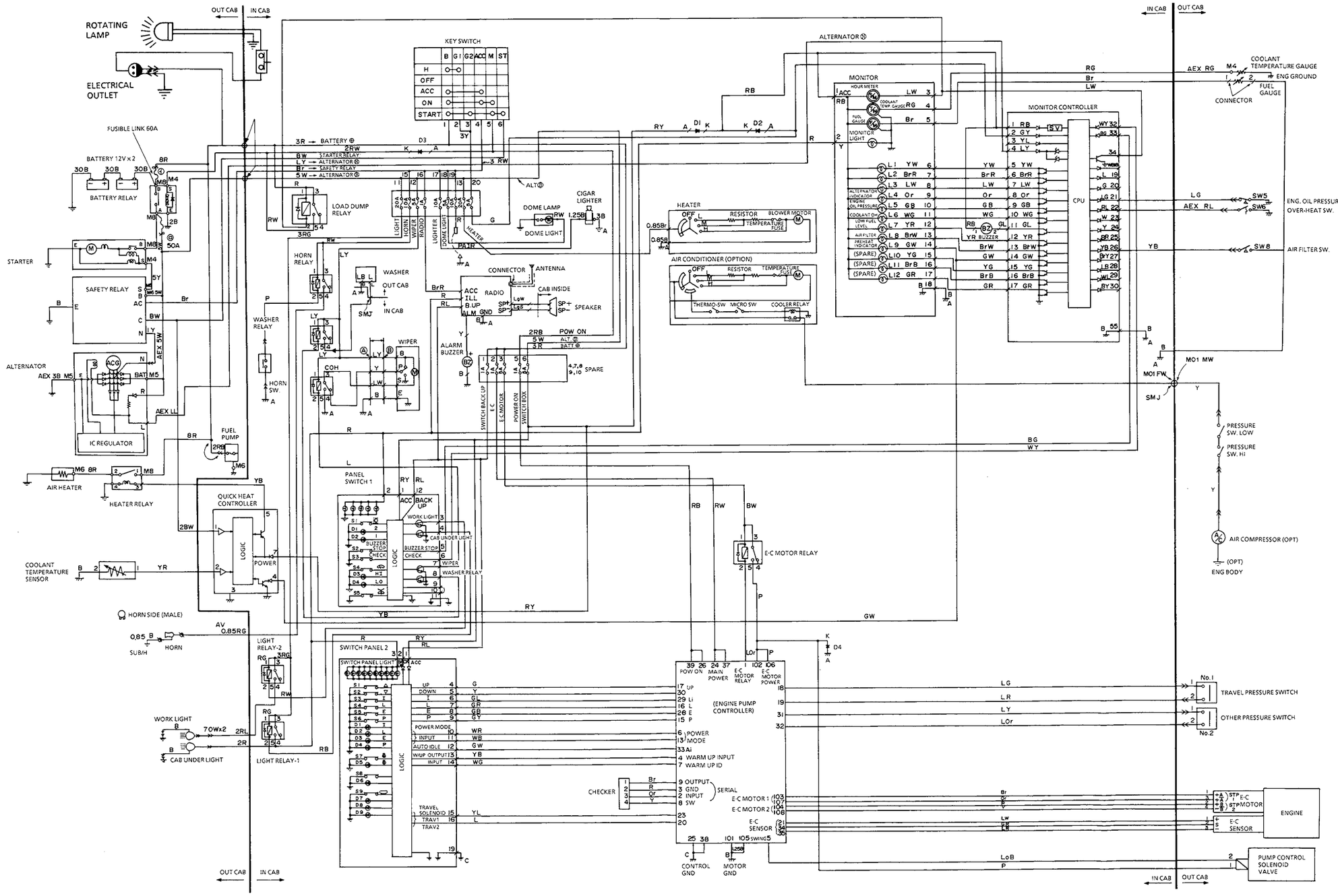
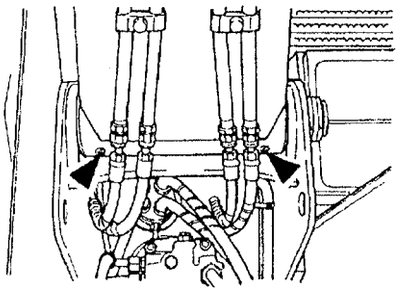
## ELECTRICAL CIRCUIT



## 1 Front Joint Pins

(1) Boom Pivot Pin, Boom Cylinder Bottom End, Bucket and Link Pins
--- every 50 hours (every 8 hours for the first 100 hours)

- Boom Pivot



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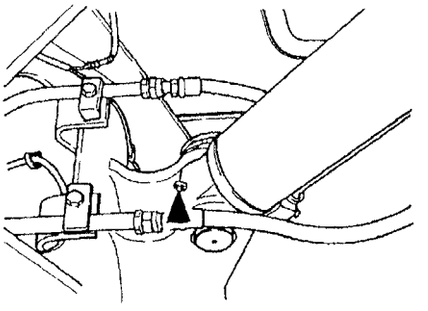
- Boom Cylinder Bottom End



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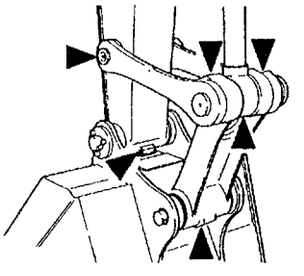
- Bucket and Link Pins



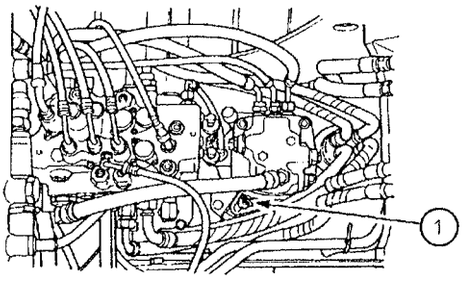
M102-07-004

*NOTE: Greasing is easier when the front attachment is in the transport position (the arm cylinder and bucket cylinder fully extended and the boom lowered to the ground).*

## 1 Swing Reduction Gear

### Check Oil Level --- every 250 hours

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Run the engine at slow idle speed without load for three minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove level gauge ①. Oil must be between marks.
8. If necessary, remove oil supply cap ③ and add oil. (See gear oil chart)
9. Recheck oil level.

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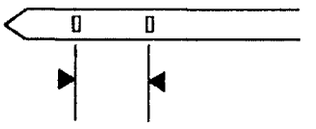


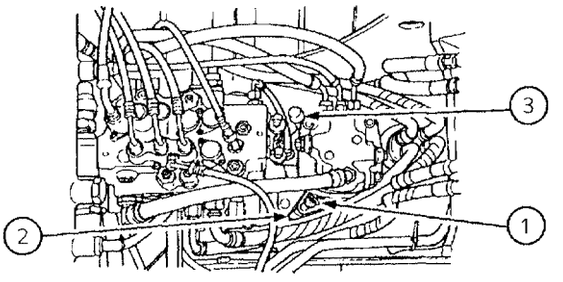
M104-07-017

### Change Gear Oil --- every 1 000 hours

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Run the engine at slow idle speed without load for three minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

**CAUTION: Gear oil may be hot. Wait for gear oil to cool before starting work.**

7. Remove the drain plug mounted on the end of drain pipe ② to drain oil.
8. Reinstall the drain plug.
9. Remove oil supply cap ③ and add oil until it is between marks on dipstick ①.

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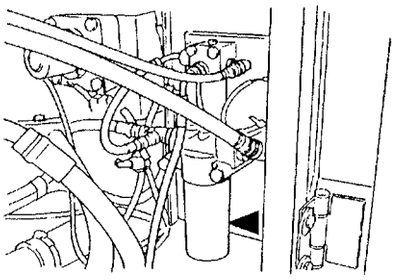
## 6 Replace Pilot Oil Filter --- every 1 000 hours

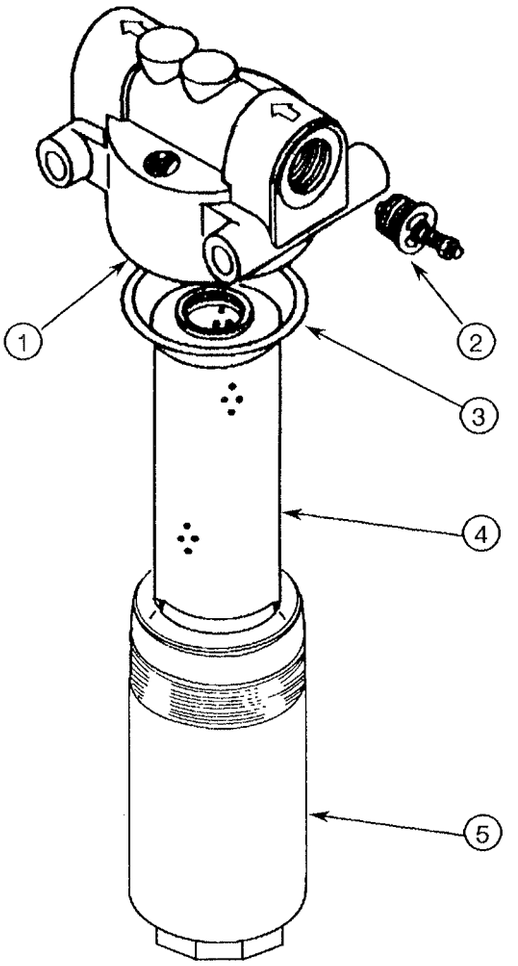


M102-07-028

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Run the engine at slow idle speed without load for three minutes.
5. Stop the engine. Remove the key from the key switch.
6. Operate the right and left control levers to release pressure from the pilot accumulator.
7. Pull the pilot control shut-off valve to the LOCK position.

**CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the cap before removing.**

8. Use a filter wrench to remove filter case ⑤ from filter head ① by turning it counter clockwise.
9. Remove filter element ④ by moving it back and forth while pulling down on it.
10. Remove and discard O-ring ③ and the element ④.
11. Clean filter head ① O-ring and the element area.
12. Apply a thin film of clean oil to a new O-ring and install it in filter head ①. Be sure O-ring ③ is correctly positioned.
13. Apply a thin film of clean oil to the ring of new element ④, that fits into filter head ①. Slowly install the element by moving it back and forth while pushing it upward.
14. Clean filter case ⑤.
15. Install filter case ⑤ onto filter head ① by turning it clockwise. Tighten case 19.5 to 29.5 N·m (2 to 3 kgf·m, 14.5 to 21.5 lbf·ft).




M104-07-030

## 4 Check Fuel Hoses
### --- daily
### --- every 250 hours

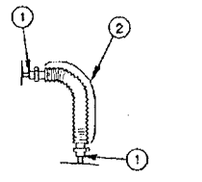
**CAUTION : Fuel leaks can lead to fires that may result in serious injury.**
**To avoid this hazard :**

1. Park the machine on a solid, level surface. Lower the bucket to the ground. Stop the engine. Remove key from the key switch. Pull the pilot control shut-off lever to the LOCK position.
2. Check for kinked hoses, and hoses that rub against each other parts for leaks.

   Check hoses at the check points indicated below for leaks and other damage that may result in future leaks. If any abnormalities are found, replace or retighten them, as shown in Table 4.
3. Repair or replace any loose or damaged hoses. Never install bent or damaged hoses.

Table 4. Hoses

| Interval(hours) | Check Points | Abnormalities | Remedies |
|---|---|---|---|
| Daily | Hose ends | Leak ① | Retighten or replace |
| | Soutache braid hose | Friction ② | Replace |
| | | Crack② | Replace |
| Every 250 hours | Soutache braid hose | Crack ③ | Replace |
| | Hose ends | Crack ④ | Replace |
| | Hose | Bend ⑤ | Replace |
| | Hose | Collapse ⑥ | Replace (Use proper bend radius) |
| | Hose ends and fittings | Deformation or Corrosions ⑦ | Replace |



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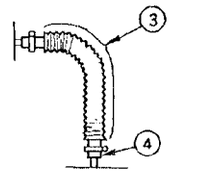

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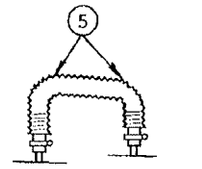

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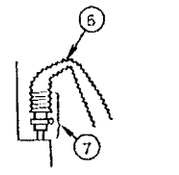


M137-07-006

Fig. 3

*Note : Refer to the illustrations in Fig.3 for each check point location or for a description of the abnormality.*
*Use genuine Hitachi parts.*

## REPLACE BATTERIES

Your machine has two 12 volt batteries with negative (–) ground.
If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

Replacement Procedure

1. Stop the engine.
2. Remove minus (–) black cable from the battery which is connected to vehicle ground.
3. Remove plus (+) red cable from the battery which is connected to the electrical circuit.
4. Remove the cable connecting the minus (–) side between the two batteries.
5. Remove the cable connecting the plus (+) side between the two batteries.
6. Remove the bolts which tighten the two batteries down.
7. Remove batteries using a hoist.
8. Install new batteries using a hoist.
9. Secure the batteries with bolts.
10. Connect the plus (+) terminals between the batteries.
11. Connect the minus (–) terminals between the batteries.
12. Connect the red cable to the plus (+) terminal of the battery which is connected to the electrical circuit.
13. Connect the black cable to the minus (–) terminal of the battery which is connected to vehicle ground.

## CONNECTING BATTERIES

After batteries are disconnected, engine speeds must be recalibrated.

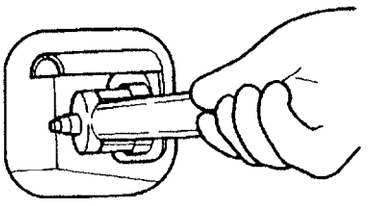
1. Turn the key switch to the ON position.
2. Press the max. power (P) mode switch to automatically recalibrate engine speeds.
3. Turn the key switch OFF.

The machine can now be started and operated as usual.

### Loosen the Track

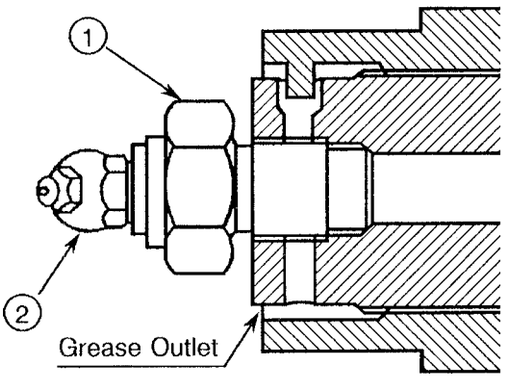
**CAUTION: Do not loosen valve ① quickly or loosen it too much as high-pressure grease in the adjusting cylinder may spout out. Loosen carefully, keeping body parts and face away from valve ①.**
**Never loosen grease fitting ②.**

**IMPORTANT: When gravel or mud is packed between sprockets and track links, remove it before loosening.**



M107-07-075

1. To loosen the track, slowly turn valve ① counterclockwise using long socket 24; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve ① is sufficient to loosen the track.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve ① clockwise and tighten to 147 N·m (15 kgf·m, 108 lbf·ft).

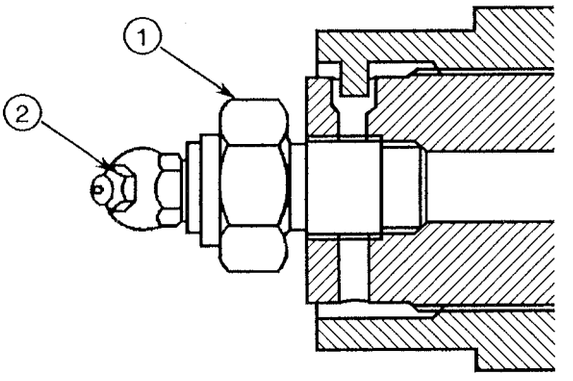



M104-07-119

### Tighten the Track

**CAUTION: It is abnormal if the track remains tight after turning valve ① counterclockwise or if the track is still loose after charging grease to fitting ②. In such cases, NEVER ATTEMPT TO DISASSEMBLE the track shoes or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.**

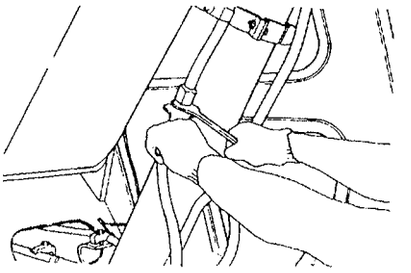
To tighten the track, connect a grease gun to grease fitting ② and add grease until the sag is within specifications.




M104-07-119

5. Retighten ORS fittings for hydraulic hoses and piping.

   Tool : 19 mm Torque : 29 N·m (3 kgf·m, 21.5 lbf·ft)
   Tool : 22 mm Torque : 39 N·m (4 kgf·m, 29 lbf·ft)
   Tool : 27 mm Torque : 93 N·m (9.5 kgf·m, 69 lbf·ft)
   Tool : 32 mm Torque : 135 N·m (14 kgf·m, 101 lbf·ft)
   Tool : 36 mm Torque : 177 N·m (18 kgf·m, 130 lbf·ft)
   Tool : 41 mm Torque : 206 N·m (21 kgf·m, 152 lbf·ft)

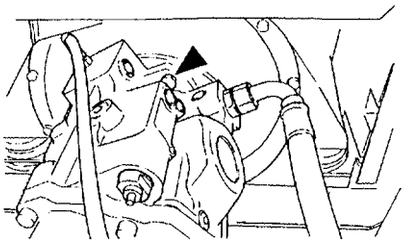


M102-07-051

6. Retighten pump mounting bolts.

   Tool : 19 mm

   Torque : 89 N·m (9 kgf·m, 65 lbf·ft)

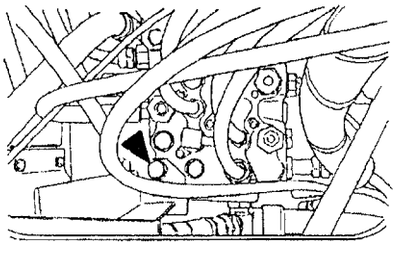


M102-07-052

7. Retighten control valve mounting bolts.

   Tool : 22 mm

   Torque : 137 N·m (14 kgf·m, 101 lbf·ft)

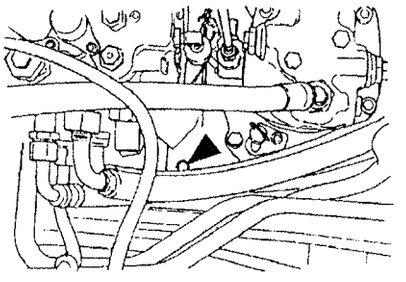


M102-07-053

8. Retighten control valve bracket mounting bolts.

   Tool : 19 mm

   Torque : 89 N·m (9 kgf·m, 65 lbf·ft)

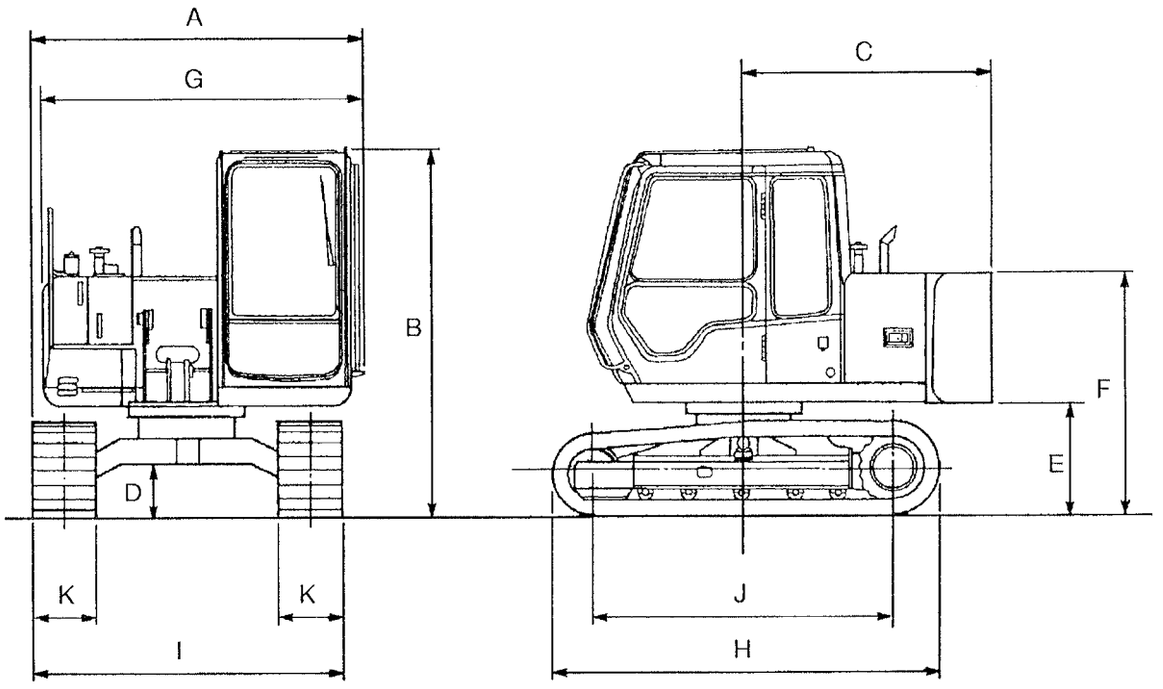


M102-07-054

## ENGINE

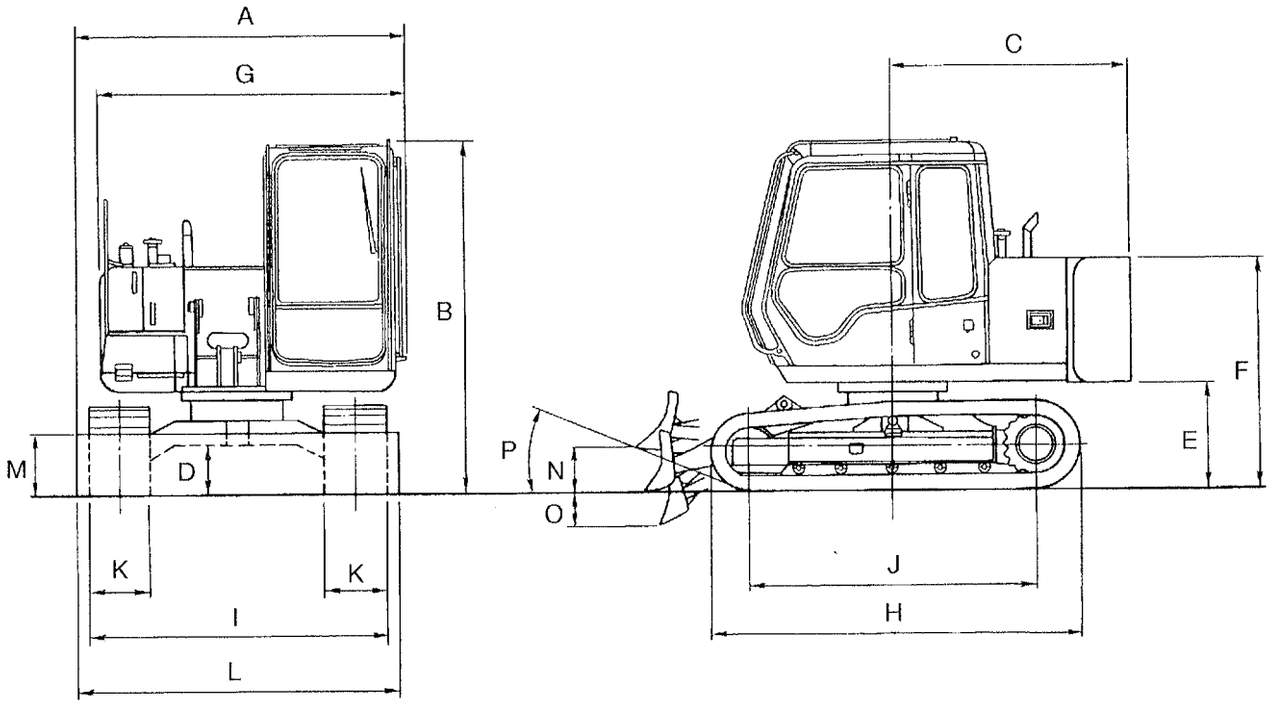
| Problem | Cause | Solution |
|---|---|---|
| **Exhaust Gas is White** | Wrong fuel | Drain tank. Use correct fuel. |
| | Cold engine | Run engine until warm. |
| | Thermostat faulty or too "cool" | See your authorized dealer. |
| | Injection pump out of time | See your authorized dealer. |
| | Coolant leakage into engine cylinder | See your authorized dealer. |

## Without Blade




M102-11-001

## With Blade




M102-11-003

## Shoe Types and Applications

### EX60-3 [For 1.62m (5'4") arm with PCSA 0.25m³ (0.33 cuyd) standard bucket]

| Shoe Width | 450 (18") Grouser Shoe | 600 (24") Grouser Shoe | 450 (18") Flat Shoe | 500 (20") Triangular Shoe | 700 (28") Triangular Shoe | 450 (18") Rubber-covered Shoe | 450 (18") Rubber Crawler |
|---|---|---|---|---|---|---|---|
| Application | For Ordinary Ground (Standard) | For Weak Footing (Option) | For Paved Road (Option) | For Weak Footing (Option) | For Weak Footing (Option) | For Paved Road (Option) | For Paved Road (Option) |
| Operating Weight kg (lb) | 6 300 (13 900) | 6 470 (14 270) | 6 460 (14 240) | 6 480 (14 290) | 6 590 (14 530) | 6 450 (14 220) | 6 180 (13 630) |
| Basic Machine Weight kg (lb) | 5 230 (11 530) | 5 400 (11 900) | 5 390 (11 880) | 5 410 (11 930) | 5 520 (12 170) | 5 380 (11 860) | 5 110 (11 270) |
| Cab Height mm (ft·in) | 2 570 (8'5") | 2 570 (8'5") | 2 580 (8'6") | 2 610 (8'7") | 2 610 (8'7") | 2 585 (8'6") | 2 570 (8'5") |
| Minimum Ground Clearance mm (ft·in) | ※360 (14") | ※360 (14") | 390 (15") | ※360 (14") | ※360 (14") | 395 (15") | 380 (15") |
| Undercarriage Length mm (ft·in) | 2 700 (8'10") | 2 700 (8'10") | 2 720 (8'11") | 2 780 (9'1") | 2 780 (9'1") | 2 730 (8'11") | 2 730 (8'11") |
| Undercarriage Width mm (ft·in) | 2 150 (7'1") | 2 300 (7'7") | 2 150 (7'1") | 2 200 (7'3") | 2 400 (7'10") | 2 150 (7') | 2 150 (7'1") |
| Ground Pressure kPa (kgf/cm²) (PSI) | 30.4 (0.31) (4.4) | 23.5 (0.24) (3.4) | 30.4 (0.31) (4.4) | 27.5 (0.28) (4.0) | 20.6 (0.21) (3.0) | 30.4 (0.31) (4.4) | 29.4 (0.30) (4.3) |

### EX60-3 [For 1.62m (5'4") arm with PCSA 0.25m³ (0.33 cuyd) standard bucket with blade]

| Shoe Width | 450 (18") Grouser Shoe | 600 (24") Grouser Shoe | 450 (18") Flat Shoe | 500 (20") Triangular Shoe | 700 (28") Triangular Shoe | 450 (18") Rubber-covered Shoe | 450 (18") Rubber Crawler |
|---|---|---|---|---|---|---|---|
| Application | For Ordinary Ground (Standard) | For Weak Footing (Option) | For Paved Road (Option) | For Weak Footing (Option) | For Weak Footing (Option) | For Paved Road (Option) | For Paved Road (Option) |
| Operating Weight kg (lb) | 6 810 (15 020) | 6 980 (15 390) | 6 970 (15 370) | 6 990 (15 410) | 7 100 (15 660) | 6 960 (15 350) | 6 690 (14 750) |
| Basic Machine Weight kg (lb) | 5 740 (12 660) | 5 910 (13 030) | 5 900 (13 010) | 5 920 (13 050) | 6 030 (13 300) | 5 890 (12 990) | 5 620 (12 390) |
| Cab Height mm (ft·in) | 2 570 (8'5") | 2 570 (8'5") | 2 580 (8'6") | 2 610 (8'7") | 2 610 (8'7") | 2 585 (8'6") | 2 570 (8'5") |
| Minimum Ground Clearance mm (ft·in) | ※360 (14") | ※360 (14") | 390 (15") | ※360 (14") | ※360 (14") | 395 (15") | 380 (15") |
| Undercarriage Length mm (ft·in) | 2 700 (8'10") | 2 700 (8'10") | 2 720 (8'11") | 2 780 (9'1") | 2 780 (9'1") | 2 730 (8'11") | 2 730 (8'11") |
| Undercarriage Width mm (ft·in) | 2 150 (7'1") | 2 300 (7'7") | 2 150 (7'1") | 2 200 (7'3") | 2 400 (7'10") | 2 150 (7'1") | 2 150 (7'1") |
| Ground Pressure kPa (kgf/cm²) (PSI) | 32.4 (0.33) (4.7) | 24.5 (0.25) (3.6) | 33.3 (0.34) (4.8) | 30.4 (0.31) (4.4) | 21.6 (0.22) (3.1) | 33.3 (0.34) (4.8) | 31.4 (0.32) (4.6) |

*NOTE: (1) The rubber crawler is designed for use on poaved surfaces. Do not use the rubber crawler on gravel or rocky ground.*
*(2) Only the 450mm (18") grouser shoe can be used on rough terrain (gravel or rocky ground). If the other shoes are used for general engineering works and works on rivers and rough grounds, they will twist the shoes and loosen the shoe bolts, causing damages to other undercarriage parts (links, rollers, track frame, etc).*
*(3) ※ The dimensions do not include the height of the shoe lug.*